QUARTERLY SUMMARY

OF THE

PROGRESS OF MEDICAL SCIENCE.

ANATOMY.

UNDER THE CHARGE OF

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THE CONSTITUTION OF THE RESTIFORM BODY.

W. BECHTEREW has studied the development of the restiform body in a series of fifteen brains, from various periods of fœtal life. He finds that this body is made up of five constituents, which are enumerated in the order of acquiring their medullary sheath: 1. The direct cerebellar tract of the cord. 2. Fibres springing from the nucleus of the funiculus cunextus of the same side. 3. Fibres springing from the lateral nucleus of the same side. 4. Fibres issuing from the nuclei of the funiculi graciles of both sides; the set derived from the nucleus of the same side ascend to the restiform body as the posterior superficial arcuate fibres; while those springing from the opposite nucleus pass forward in the interolivary layer (olivenzuischenschichl), and emerge on the inner side of and through the pyramid, as well as between the pyramid and the olive, and form the anterior superficial arcuate fibres. 5. Fibres from the lower olive of the opposite side.

The last set of fibres were demonstrated by Meynert; but they do not, as assumed by Meynert and Wernicke, form a continuation of the posterior columns to the cerebellum. They compose, with a tract of fibres previously shown by Bechterew, ascending in the tegmentum, a system which unites the cerebellum with the base of the cerebrum through the lower olive.

Neither the formatio reticularis nor the pyramid of the medulla oblongata has any relation to the restiform body; nor does the latter receive any fibres from the fifth and eighth nerves, as stated by Edinger. The auditory nerve is connected to the cerebellum by a special bundle which ascends in the inner part of the middle peduncle. The fifth nerve has no connection at all with the cerebellum.

Within the cerebellum, the restiform body is distributed in three distinct bundles, viz.: 1. Containing the fibres from the direct cerebellar tract of the cord, from the nucleus of the funiculus cunextus, and from the lateral nucleus passes to the cortex of the forepart of the upper worm; 2. Composed of the fibres from the nuclei of the funiculi graciles, to the middle portion of the upper worm on the same side; and 3. Comprising the fibres from the opposite olive, to the gray substance of the corpus dentatum, and in part, perhaps, to the cortex of the hemisphere.—*Archiv für Anatomie*, February, 1887.

THE MORPHOLOGY OF THE SACRAL PLEXUS.

It is by no means an unfrequent occurrence for the two popliteal nerves to arise separately from the sacral plexus; and in that case the external (or peroneal) nerve generally pierces the pyriformis muscle, the lower portion of which, therefore, separates this from the more deeply placed internal nerve. But when, in the usual arrangement, these nerves are united for a certain portion of their extent in a great sciatic trunk, the latter can be easily divided into its two constituents by dissecting off the fibrous sheath, and the popliteal nerves can be followed upward to their distinct origins. By thus separating the nerves, A. M. PATERSON is enabled to show that the construction of the sacral plexus agrees in principle with that of the brachial, and to throw light upon the morphology of the nerves of the limbs.

The nerves proceeding to the popliteal trunks are each divided into an anterior and a posterior branch. By the union of the posterior branches of the descending offset from the fourth lumbar, of the fifth lumbar, and of the first and second sacral nerves, the external popliteal is formed; and the anterior branches of the same nerves, together with an offset from the third sacral, constitute the roots of the internal popliteal. The gluteal nerves are offsets of the posterior divisions, or external popliteal roots, the superior arising from the fourth and fifth lumbar and the first sacral nerves, and the inferior from the first and second sacral nerves. The small sciatic arises from the back of the second and third, and the pudic from the second, third, and fourth sacral nerves. The branch to the obturator internus springs from the second and third sacral nerves, that to the quadratus from the beginning of the internal popliteal nerve, and the nerve of the pyriformis from the posterior branch of the second sacral. The branches to the hamstring muscles are given off from the internal popliteal nerve.

Like the popliteal nerves, the obturator is formed by anterior branches, and the anterior crural by posterior branches of the second, third, and fourth lumbar nerves.

There are thus two chief sets of nerves passing to the lower limb—one comprising the anterior crural, external popliteal and gluteal, springing from posterior branches, and distributed in the original extensor aspect; and the other, consisting of the obturator and internal popliteal, springing from anterior branches, and passing to the flexor aspect of the limb. From this it is inferred that in the primitive condition of the limbs the nerves passing into them are divided into dorsal and ventral branches, which supply the corresponding surfaces, and that indications of this arrangement are retained in the mode of origin of the nerves and their distribution to the structures of the limb.—*Journal of Anatomy*, April, 1887.

ON THE BURSA PHARYNGEA.

The name bursa pharyngea was given by F. J. C. MAYER to a small pouch of the mucous membrane described by him, and afterward more fully by

Luschka, as projecting from the upper end of the posterior wall of the pharynx. According to Luschka, this pouch may attain a length of 15 mm. and a breadth of 6 mm.; it lies behind the adenoid tissue, constituting the pharyngeal tonsil; and its blind upper extremity is connected with the basilar process of the occipital bone. The normal existence of such a pouch has been denied by Ganghofner and Trautmann, who found only a small depression of the mucous membrane at the spot indicated; and for this, Ganghofner proposed the name of *recessus pharyngeus medius*. On the other hand, Tornwald states that a sac or canal is present in the great majority of cases.

In view of these conflicting statements, SCHWABACH examined this region in 53 subjects, 28 being infants or young children, in whom alone a normal pharyngeal tonsil is to be seen, and in no case did he find a bursa as described by Luschka, while Ganghofner's account is fully confirmed.

In the young subject the pharyngeal tonsil is divided by fissures into ridges of variable height, which are directed for the most part more or less obliquely. On most preparations two ridges close to the middle line are more prominent than the rest, and enclose a central furrow of corresponding depth. In some cases, however, there is a median ridge dividing this furrow. At the back of the median furrow or ridge there is generally a slight depression about the size of a pin's head, and in four instances it took the form of a recess 2 or 3 mm. deep. A small transverse fold of the mucous membrane sometimes divides this depression into anterior and posterior parts, or separates it from the groove. In several cases there was no trace at all of this hollow; and in no instance was it more than a superficial depression of the mucous membrane devoid of any connection with the bone.

In the adult there are usually but few indications of the original conformation of the tonsil, the median cleft and its bounding ridges being the parts most frequently retained; but even when all the ridges have disappeared, the furrow is still represented by a slight fossa or a canal bridged over by the mucous membrane. Such bridges of mucous membrane are of frequent occurrence on the pharyngeal tonsil, on the roof of the pharynx, and in the recess of Rosenmüller; and the cavities may also be completely enclosed by mucous membrane giving rise to cysts. The descriptions of the bursa given by Luschka and Tornwald are regarded as relating to pathological states.

It has been shown by Dursy and Froriep that the recessus pharyngeus medius is not connected with the formation of the hypophysis cerebri; and the latter writer considers it probable that it is related to the retropharyngeal chorda. On this point Schwabach promises a further communication dealing with researches now in progress.—*Archiv für microskop. Anat.*, Feb. 1887.

ON THE CLOSURE OF THE CARDIAC ORIFICE OF THE STOMACH.

It was observed by Braune that water injected in considerable quantity into the stomach through the œsophagus, with the body in a horizontal position, does not flow out again, although no ligature is applied. To explain this phenomenon, A. v. GUBAROFF, working in Braune's laboratory, investigated the mechanism by which the cardiac orifice is closed. In part the closure is to be explained by the action of the diaphragm, the fibres of which form a sphincter around the œsophageal opening; but it is mainly due to a valvelike arrangement dependent on the relation of the ending of the œsophagus to the stomach.

In a frozen section, the stomach being distended, the lower end of the œsophagus is seen to be bent sharply to the left, the fundus of the stomach extends upward considerably beyond the cardia, and the left margin of the latter projects toward the right or lower border in the form of a rounded edge or fold containing a thick bundle of fibres of the diaphragm. When water is injected under a low pressure into the stomach from the duodeno-jejunal flexure, it does not flow into the œsophagus so long as the parts are in their natural position; but if the stomach is drawn downward, so as to stretch the angle between the œsophagus and the fundus, the fluid enters the gullet. In the child the œsophagus takes a straighter course to the stomach, and the facility with which food regurgitates in the infant is thus accounted for. Perhaps the varying readiness with which vomiting occurs in different people is to be attributed to the degree of development of this valvular structure.—*Archiv für Anatomie*, February, 1887.

ON THE POSITION OF THE DUODENUM, OF THE ILEOCOLIC JUNCTION, AND OF THE SIGMOID FLEXURE.

P. SCHIEFFERDECKER publishes observations on the variations in position of certain parts of the intestinal canal, collected during the dissection of about two hundred bodies in Rostock and Göttingen. In the duodenum the only noteworthy class of deviations relates to the length of the second part, and the consequent level at which the third part crosses the spine. This may be as high as the disk between the second and third lumbar, or as low as the top of the fifth lumbar vertebra. The situation of the duodeno-jejunal flexure is very constant.

The opening of the ileum into the large intestine is most frequently placed on a level with, and a little to the outer side of the right sacroiliac articulation. A lower position is often met with; and occasionally it lies in the cavity of the true pelvis. Only two cases were met with in which the ending of the ileum had a markedly higher position than usual; in one it was opposite the third lumbar vertebra; and in the other in front of the kidney, on a level with the second lumbar vertebra, so that there was practically no ascending colon. In both these instances the other abdominal organs were normal, and the testicles were in the scrotum.

The position of the sigmoid flexure is very variable, and the different forms are collected into four groups, as follows:

I. The flexure lies to the inner side of the descending colon.

a. The loop hangs down in the pelvic cavity. This is regarded as the normal form as shown by the developmental history, and by its being mechanically the most natural.

b. The loop is turned upward and applied to the posterior abdominal wall. In one extreme case the loop ascended on the side of the spine to the left kidney, being fixed here by the peritoneum; and in another the loop, having a free meso-sigmoideum, crossed the middle line and reached the right iliac fossa, where it touched the cæcum. Between these extremes all intermediate forms occur.

c. The loop is directed upward, but other parts of intestine intervene between it and the posterior wall; and it may come in contact to a greater or less extent with the anterior wall. These cases are very frequent.

II. The flexure lies to the outer side of the descending colon. Only one example of this condition was met with; and it is probable that it differs in kind from the foregoing groups, being not merely an irregular position of an identical loop, but a loop formed in the intestine immediately above the situation of the normal one which is undeveloped.—*Arch. für Anat.*, Feb. 1887.

ON THE RELATIVE LENGTH OF THE FINGERS AND TOES.

W. **BRAUNE** contributes some interesting observations on the form of the hand and foot in a paper contained in the volume recently dedicated to C. Ludwig by his pupils. It is well known that in works of art the hand is generally represented with the index finger more prominent than the ring finger, whereas in nature such a form is only met with exceptionally. But the attempt to estimate the length of the several fingers by inspecting the hand, or even by tracing the outline on paper, after Ecker's method, is fallacious; and only direct measurements of the bones yield trustworthy results. Braune gives a table of the length of the metacarpal bones and phalanges in 93 hands, in 39 of which the bones were still united by their ligaments, while the remaining 54 were artificially mounted. In the following statistics the latter group is not taken into account, since there may be doubt as to the proper position of some of the bones.

Taking the metacarpal bones and phalanges together, the index finger is longer than the ring in 27, and shorter in 10, while the two are equal in 2. In all the second metacarpal bone is longer than the fourth, and the phalanges of the ring finger are longer than those of the index finger. The first phalanx of the index is the longer in 33, of the ring finger in 3, and the two are equal in 3. The middle phalanx of the ring finger is the longer in all. The last phalanx of the ring finger is the longer in 34, that of the index in 4, and in one case the two are equal.

The greater length of the index finger as a whole thus depends entirely (as was pointed out by J. Marshall, in his *Anatomy for Artists*, 1887) on the length of the metacarpal bone. The greater prominence of the ring finger usually seen in the hand is attributed by Braune to a lateral inclination of the fingers to the ulnar side, due primarily to the oblique pull of the flexor muscles. The hand with a longer index finger is the higher form, not simply by reason of contrast with the hand of the ape, but because it is thereby better fitted for the special work of man.

In the same way, the foot is generally represented by artists with the second toe projecting beyond the first, but in the natural foot the great toe almost always appears the most prominent. This appearance is, however, a result of the flexion of the second toe, caused by the pressure of the shoe; and if it be carefully straightened, the second toe is generally found to be the longest. Of 37 students of his class, Braune found the second toe longer in 26, the great toe longer in 6, and the two of equal length in 5. In children and people who go barefooted the second toe is the longest.

The characteristic forms of the hand, with its longest third digit, and of the foot, with its longest second toe, are evident at a very early period in the fœtus. Whether there is any variation in the proportions referred to among different races of men, as assumed by Ecker, Kollmann, and Park Harrison, the material at present available is insufficient to show.

PHYSIOLOGY.

UNDER THE CHARGE OF

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Visual Centres of Cerebral Cortex.

Prof. Sigm. Exner and Dr. Joseph Paneth found defective vision, lasting some weeks after the operation, to follow removal of parts of the sigmoid gyrus of the dog. This was observed in five out of six animals. In that in which there was no defect of vision the lesion was just in front of Munk's centres. They therefore agree with those authors who deny that the visual functions are to be restricted to the posterior parts of the convexity of the brain.—*Pflüger's Archiv*, Bd. xl. p. 62.

Irritability of the Various Layers of the Cerebral Cortex.

Drs. Ernst Asch and Alfred Neisser experimented on rabbits to determine whether gray surface tissue or the underlying white substance of the motor regions of the brain be the more easily excited by electric stimulation. They conclude that in the track from the surface to the deeper parts of the brain there exists a point the stimulation of which is followed by much more active movements than if any other part of the path of the impulse be similarly stimulated. This point is the boundary between the gray and white substance, and most probably it really is the innermost layer of the gray matter. With weak stimulations, the electrodes piercing the gray matter, the authors frequently found movement of the limbs on the same side of the body as the stimulus was applied to the brain.—*Pflüger's Archiv*, Bd. xl. p. 191.

Intracardiac Pressure.

J. Magini estimates the variations in the blood-pressure within the heart of dogs by means of a special trocar pushed through the apex. The position and surroundings of the organ were but little disturbed by the operation, which was borne well by the animals, so that the investigation could be continued sometimes for an hour. Only twice in twenty-one operations did insurmountable complication arise. The trocar was connected with a manometer and cardiographic apparatus by means of a thick-walled caoutchouc tube filled with soda solution. The action of the valves thus escaped the interference with their function inseparable from Marey's mode of procedure.